

App. No. 10/718,961

Reply to Office action of July 13, 2005

### REMARKS/ARGUMENTS

#### A. Summary of the Amendment

This is a full and timely response to the non-final Office Action dated July 13, 2005. Reexamination and reconsideration are courteously requested. By way of the present amendment, claims 1, 9, and 20 are amended. No claims are added or canceled, and no claims have been withdrawn as the result of a restriction requirement. Thus, claims 1 to 24 remain pending for the Examiner's consideration, with claims 1, 9, and 20 being independent claims.

By way of explanation, the amendment of the phrase "a titanium base metal or an alloy thereof" to "a base metal of titanium or alloy thereof" is made to clarify that the subsequent use of the term "base metal" in the claims refers to either titanium or a titanium alloy, and does not solely refer to titanium. The reasons for the other amendments to the claims will become evident from the following discussion of the prior art.

#### B. Rejections Under 35 U.S.C. § 103(a)

Claims 1 to 24 are rejected as being unpatentable over U.S. Patent No. 6,656,410 ("Hull") in view of U.S. Patent No. 6,048,954 ("Barlow"). These rejections are respectfully traversed in view of the present amendment.

Claims 1 and 20 recite that a powder blend, for fabricating a metallic part using a method such as selective laser sintering, includes a titanium-including base metal having a first melting temperature, and an alloying metal that has a second melting temperature. Those claims further recite that the base and alloying metals are selected based on a characteristic of the base metal to dissolve in but not react with the liquid alloying metal at an annealing temperature between the first and second melting temperatures.

Neither Hull nor Barlow teaches or suggests the features recited in claims 1 and 20. Hull lists some metallic powders (col. 2, lines 7 to 13) that may be combined with a bonding

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agent to form a paste. The powders listed by Hull include titanium, titanium alloy, tin, and others. However, Hull does not mention that two metallic powders are combined in a paste, or in a powder blend as recited in pending claims 1 and 20.

Moreover, even if a person of skill in the art chose to combine two metallic powders from the list Hull discloses, there is no teaching or suggestion that the two metallic powders should be selected based on a characteristic that the powder with the higher melting temperature would dissolve in, but not react with, a liquid of the metal having the lower melting point. Rather, Hull discloses that the pastes that include the metallic powders are cured or otherwise react as a result of exposure to radiation.

Barlow fails to compensate for the deficient teachings in Hull. Barlow discloses that two metals in a powder are selected based in part on "a significant difference in the melting points ... such that the power capability of the laser (or other energy beam) is able to melt the material having the lower one of the melting points while not melting the material with the higher melting point" (col. 9, lines 60 to 68). Further, Barlow discloses that one of the metals may be titanium (i.e. Al-Ti or Pd-Ti). However, Barlow teaches away from the pending claims by disclosing that the two metals must be able to react to form a compound of the two metals, and further recites that during an annealing step at a temperature between the melting points for the two metals, the melted metal infiltrates and reacts with the solid metal (e.g. col. 10, lines 4 to 7, 17 to 21; col. 11, lines 6 to 12).

Comparing the teachings of Hull and Barlow with those of the present specification (page 6, paragraph 0021) and claims 1 and 20, it is clear that a person of ordinary skill in the art would not find a teaching or suggestion in the cited prior art of base and alloying metals that are selected based on a characteristic of the base metal to dissolve in but not react with the liquid alloying metal at an annealing temperature between the melting temperatures of the two metals. Consequently, it is respectfully submitted that the rejections of claims 1 and 20, and the claims depending there from, should be withdrawn.

Independent claim 9 recites the relationship between the base and alloying metals by positively reciting a step of annealing a preform part that includes the base and alloying metals.

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The annealing step includes "heating the preform part at a temperature sufficient to melt said alloying metal and dissolve the alloying metal therein to form a hyper-eutectic liquid composition; and continuing to heat the hyper-eutectic liquid composition until it solidifies."

As previously discussed, Hull and Barlow are both directed to processes wherein two metals react with each other to form a compound. Since neither reference teaches or suggests the features recited in claim 9, withdrawal of the rejection of claim 9, and those claims depending there from, is respectfully requested.

#### H. Conclusion

In view of Applicant's amendments and remarks, it is respectfully submitted that Examiner's objections and rejections have been overcome. Accordingly, Applicants respectfully submit that the application is now in condition for allowance, and such allowance is therefore earnestly requested. Should the Examiner have any questions or wish to further discuss this application, Applicants request that the Examiner contact the Applicants attorneys at the below-listed telephone number.

If for some reason Applicants have not requested a sufficient extension and/or have not paid a sufficient fee for this response and/or for the extension necessary to prevent abandonment on this application, please consider this as a request for an extension for the required time period and/or authorization to charge Deposit Account No. 50-2091 for any fee which may be due.

Respectfully submitted,

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Dated: Sep. 29, 2005

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